153648

ACTION MEMORANDUM

DATE: FEB 27 1996

SUBJECT: Documentation of Verbal Authorization for a Removal Action at Pyridium Mercury Disposal Site No. 1, Village of Harriman, Orange County, New York

FROM: James D. Harkay, On-Scene Coordinator
Removal Action Branch Section B

TO: Kathleen C. Callahan, Director
Emergency and Remedial Response Division

THRU: Richard C. Salkie, Associate Director
Removal and Emergency Preparedness Programs

Site No.: EV

I. PURPOSE

The purpose of this Action Memorandum is to document the verbal authorization received to conduct a removal action at the Pyridium Mercury Disposal Site No. 1 (Site). The Site is located on Route 17M within the Village of Harriman, Orange County, New York, 10926.

The Site consists of a residential/commercial property which was backfilled with mercury contaminated industrial waste. Five mobile home trailers inhabited the Site. This document details the rationale used to conduct the removal activities implemented at the Site and discusses how the Site met the criteria for a removal action under Section 300.415(b)(2) of the National Contingency Plan (NCP).

On January 4, 1995, the U.S. Environmental Protection Agency (EPA) Emergency and Remedial Response Division (ERRD) Director granted verbal authorization to conduct a removal action at the Site to decontaminate or dispose of the five mobile home trailers. The funding approval to address the mobile home trailers was $100,000, of which $75,000 was for mitigation contracting.

ERRD: NAME:Pyridium #1: INIT:sb: DATE:08/23/95 CONCURRENCES DISK:A.M.#10: FILENAME:00[illegible]

SYMBOL: ==>	ERRD-RAB	ERRD-RAB	ERRD-RAB	ERRD-ADREPP	ORC-NYCSUP	ERRD-D		
SURNAME:==>	Harkay	Rotola	Zachos	Salkie	Scheaf	(Callahan)		
DATE: ==>	8/22/95	8/23/95	8/23/95	8/25/95	9/5/95	2/27/96		

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The Site is not on the National Priorities List (NPL) and there were no nationally significant precedent-setting issues associated with the removal action.

II. SITE CONDITIONS AND BACKGROUND

The Comprehensive Environmental Response, Compensation, and Liability Information System ID Number for this time-critical removal action is NY0000856237.

A. Site Description

1. Removal site evaluation

On August 8, 1994, responding to a complaint, representatives from the New York State Department of Health (NYSDOH) and the New York State Department of Environmental Conservation (NYSDEC) discovered a white clay-like waste material during their investigation. Samples of the waste material were collected and submitted for laboratory analyses. The analyses indicated elevated concentrations of mercury ($\leq$657 mg/kg). A concentration of mercury typically found in soils within this geographic area is $\leq$1 mg/kg. Mercury is a designated Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substance and is listed in 40 CFR Table 302.4.

In a correspondence dated September 9, 1994, the NYSDOH outlined site conditions and requested the NYSDEC to seek assistance from the EPA to address the threats to public health, welfare and the environment. On September 29, 1994, the Site was formally referred to the EPA for a CERCLA removal action consideration via correspondence from the NYSDEC (Appendix A).

From October 13-15, 1994, the EPA and their Technical Assistance Team (TAT) contractor conducted a removal site evaluation that included verification of mercury contamination as well as delineating lateral extent of contamination in surface soils. A total of 54 surface soil samples were analyzed using a Spectrace Model 9000 X-Ray Fluorescence Analyzer (XRF). Results from the XRF indicated widespread (i.e., $\approx$ 15,000 square feet) mercury contamination of the surface soils within the trailer park.

On October 20, 1994, one composite waste sample was collected for waste characterization and mercury speciation. For waste characterization, the sample was analyzed for Target Compound List (TCL) parameters, Target Analyte List (TAL) parameters, and toxicity via the Toxicity Characteristic Leachate Procedure (TCLP). Analytical results for TAL parameters indicated elevated concentrations of mercury and calcium. TCL compounds detected in the composite sample included: methylene chloride, pyrene, phenanthrene, fluoranthene, benzo(k)fluoranthene, benzo(b)fluoranthene, benzo(a)anthracene, chrysene and

benzo(a)pyrene. However, these volatile and semi-volatile organic compound concentrations were below NYSDEC-recommended soil cleanup objectives and the TCLP results were below regulatory levels. Mercury speciation results indicated that the sample was a chemical substrate contaminated with a mercuric or mercurous salt and was not elemental mercury.

On November 17, 1994, the EPA's Environmental Response Team (ERT) and EPA's Response Engineering and Analytical Contractor (REAC) collected dust samples from each of the five mobile homes. Analytical results of the sampling event indicated mercury concentrations ranging from 0.84 mg/kg to 26.8 mg/kg. The highest concentration was detected within the entrance area into mobile home No. 3.

On December 6, 1994, the ERT, REAC and the TAT contractor collected soil samples from borings to determine the vertical extent of contamination. Soil samples were screened using an XRF for the presence of mercury. Based upon the XRF data, it is estimated that 3,600 cubic yards of waste and contaminated soil exists on the Site.

2. Physical location

Pyridium No. 1 is located in a mixed residential/commercial area at the intersection of Route 17M and Harriman Heights Road (Appendix B, Figure 1). The Site's property (Block No. 5: Lot No. 2) is bordered on the northwest by an auto transmission shop, on the northeast by Route 17M, on the southeast by wetlands and on the southwest by a residential lawn (Appendix B, Figure 2). (The wetlands are not formally designated as such on the corresponding U.S. Department of the Interior National Wetland Inventory Map). Approximately 16 people resided in the five mobile homes which varied in size from 400 to 900 square feet. An elementary school is located approximately 1,000 feet north of the Site.

3. Site characteristics

The Site occupies approximately one acre out of the property's total area of 1.93 acres. On-site contamination is reportedly from the disposal of mercury contaminated industrial waste generated by the Pyridium Corporation. Disposal of the waste occurred during the 1940's when the material was used as backfill in low-lying areas on the property.

This Action Memorandum addresses a removal action restart. See Section II.B for a discussion of the previous removal action.

4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

Mercury, a designated CERCLA hazardous substance as defined by Section 101(14) is present on the Site. The mercury contaminated waste is visible in surface soils and has been identified in subsurface soils. Site investigations indicated approximately 3,600 cubic yards of waste was disposed of on the Site. The waste is unconfined and has migrated off-site into an adjacent wetlands from storm water drainage. Since the waste is present in surface soils, the potential exists for the hazardous substance to be tracked off-site by humans and animals visiting the Site.

5. NPL status

The Site is not listed on the NPL. A Preliminary Assessment (PA) may be conducted to determine the need for a Site Inspection (SI) for possible NPL listing. The Site has been evaluated by the Agency for Toxic Substance and Disease Registry (ATSDR). The health consultation is included in Appendix C.

6. Maps, pictures and other graphic representations

Figures 1 and 2 which are included in Appendix B, illustrate the location and configuration of the Site.

B. Other Actions to Date

1. Previous actions

On October 12, 1994, a public meeting was held in the Village of Harriman to discuss the Site situation and to address community concerns. The meeting was attended by representatives of the Village of Harriman, Orange County Department of Health, NYSDOH, NYSDEC, ATSDR and EPA. On November 28, 1994, a public availability session was held in the Village of Harriman. The session was attended by representatives of NYSDOH, ATSDR and EPA. Analytical results of the October 13-20, 1994 sampling events were made available to the public during this meeting.

On November 28, 1994, Nepera, Inc., signed an Administrative Order on Consent (AOC) with EPA agreeing to fund the relocation of the trailer park residents. Nepera, Inc. has distributed relocation settlements to the eligible residents according to federal relocation guidelines.

In January 1995, a Final Health Consultation Report was prepared by the NYSDOH under a cooperative agreement with the ATSDR (Appendix C). The report states that the Pyridium Site is a public health hazard due to elevated mercury concentrations in

soils. On-site residents are suspected to be at risk of kidney damage through mercury ingestion/inhalation.

2. Current actions

The purpose of this action was to secure and stabilize the Site. On January 9, 1995, the EPA Emergency Response Cleanup Service (ERCS) contractor and the TAT contractor mobilized and initiated the removal action. After the mobile homes were vacated, they were decontaminated, sampled and relinquished to their owner for resale. However, due to the condition of the mobile homes, only two were able to be sold. The remaining three were dismantled on-site and discarded as debris. Prior to being sold, interiors of the two mobile homes were decontaminated. Decontamination was accomplished by cleaning all hard surfaces, dusting all air-conditioning and heating ducts and removing all porous materials (e.g., carpets, curtains, furniture, etc...). Following decontamination, interior dust samples were collected to verify attainment of acceptable interior cleanup levels. All utilities (water, sewer, electric) were disconnected and all heating oil and propane storage tanks were removed for disposal/recycle. Warning signs were clearly posted to inform the public of the conditions on the Site.

The mitigation contracting cost to complete this removal action was approximately $51,000.

C. State and Local Authorities' Role

1. State and local actions to date

In August 1994, the NYSDEC and the NYSDOH conducted preliminary investigations at the Site. These investigations involved the collection of soil samples from visibly contaminated areas, sampling indoor and outdoor air, utilizing a mercury vapor analyzer and meeting with the affected residents to discuss public health concerns. During the month of October 1994, the NYSDOH conducted urine mercury screening of the mobile home residents. A total of 14 individuals participated in the testing program. All 14 individuals had urine mercury levels within the normal range of <20 micrograms per liter. Both State agencies provided health education services to the affected residents during the EPA removal activities.

2. Potential for continued State/local response

State and local government agencies were not able to undertake timely and costly response actions to eliminate the threats posed by the Site. However, the NYSDOH offered health education services to the affected residents. The NYSDOH will investigate similar sites in the community as they are identified.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

This Site met the criteria for a removal action under CERCLA as described in Section 300.415(b)(2) of the NCP. The Site posed a health threat to local residents and animals that could come in direct contact with the hazardous substances at the Site. High concentrations of the hazardous substance on ground surfaces have migrated and contaminated a larger area through surface water run-off and anthropogenic redistribution.

A. Threats to Public Health or Welfare

The presence of elevated concentrations of a designated CERCLA hazardous substance was documented in surface and subsurface soils. Analytical results of 11 surface soil samples analyzed by Cold Vapor Atomic Absorption indicated the presence of mercury at concentrations ranging from 3.74 mg/kg to 657 mg/kg. Laboratory analysis of dust samples collected from the mobile home interiors identified mercury concentrations that ranged from 0.84 mg/kg to 26.8 mg/kg. Toxicological data regarding mercury exposure documented the risk of potential kidney and neurological system damage.

Former residents of the trailer park have reportedly been exposed to mercury contamination via dermal contact. A Final NYSDOH/ATSDR Health Consultation Report noted that a resident reported, in an interview, that her children used to play with the clay-like waste material as if it were modelling clay. According to the report, 16 people resided within the mobile home park.

B. Threats to the Environment

Data indicates that a potential exists for contaminant migration via overland storm drainage routes. Mercury surface soil contamination was documented on site at concentrations ranging from 3.74 mg/kg to 657 mg/kg. Low level mercury contamination (13.7 mg/kg, 15.9 mg/kg, 38.9 mg/kg) was also documented in a wetland area located east of the waste disposal area. Although no visible waste material was observed at the wetland area, sampling results indicate that contaminants have migrated from the waste disposal area.

A sediment sample was also collected at the outfall of a drainage culvert located northeast of the Site, across from Route 17M. Analytical results of the sediment sample indicated the presence of mercury at a concentration of 0.643 mg/kg. Therefore, the possibility of off-site migration of mercury contamination via this overland storm drainage route exists.

IV. ENDANGERMENT DETERMINATION

Actual or threatened release of a hazardous substance from this Site, if not addressed by implementing the response action selected in this Action Memorandum, may have presented an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The purpose of this Action Memorandum is to document actions taken by the EPA at the Site under the January 4, 1995 verbal authorization by the Director of the ERRD. The removal action effectively decontaminated two mobile homes qualified for resale and dismantled and disposed of the three mobile homes unfit for resale. The removal action under this Action Memorandum has been completed at a cost of $51,000 for mitigation contracting.

Additional actions such as excavation and disposal of mercury contaminated soil and restoration of properties to pre-existing conditions are necessary to mitigate the threats to the public health, or welfare, or the environment. These actions will be undertaken under a separate removal action.

2. Contribution to remedial performance

The actions presented in this document were consistent with any long term cleanup at the Site and were interim measures necessary to mitigate the immediate threats associated with the hazardous substance on the Site.

3. Description of alternative technologies

The decontamination and removal/disposal of the mobile homes was the only technology considered because this was the most cost effective and evironmentally sound method.

4. EE/CA

Due to the time-critical nature of this removal action, an Engineering Evaluation/Cost Analysis (EE/CA) was not prepared.

5. Applicable or relevant and appropriate requirements (ARARs)

ARARs that are within the scope of this removal action were met to the extent practicable. The federal ARARs that were determined to be applicable for this removal action are the

Resource Conservation and Recovery Act and the Occupational Safety and Health Act.

6. Project schedule

The removal action was initiated on January 9, 1995 under the verbal authorization from the Director of the ERRD and was completed on March 7, 1995.

B. Estimated Costs

A summary of the estimated costs for the completed removal action is presented below.

Extramural Costs:	
Total Cleanup Contractor Costs	$51,000
Other Extramural Costs not Funded from the Regional Allowance:	
Total TAT	$11,000
TOTAL, EXTRAMURAL COSTS	**$62,000**
Intramural Costs:	
TOTAL, INTRAMURAL COSTS	**$ 9,000**
TOTAL, REMOVAL PROJECT COST	**$71,000**

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

The actions outlined in this Action Memorandum were an interim measure to stabilize and secure the Site. If no action was taken or the action delayed, the vacant trailers could have attracted trespassers which would have resulted in a risk to public health through exposure to mercury contaminated soil. Furthermore, since the mobile homes would be vacated and unsecured, unauthorized persons could have entered the property and vandalized the mobile homes resulting in possible fire and explosions due to the presence of aboveground oil and gas storage tanks.

VII. OUTSTANDING POLICY ISSUE

None.

VIII. ENFORCEMENT

Site related enforcement activities were initially limited to time constraints resulting from the time-critical determination for the removal action.

In October 1994, the EPA/TAT contractor conducted a title and deed search of the property. Property owner information was obtained from 1894 to the present and is being kept on file.

The on-site waste was reportedly generated during the 1940's by the Pyridium Corporation. Nepera, Inc., currently owns and operates the facility previously operated by Pyridium Corporation. On November 28, 1994, Nepera, Inc., signed an AOC with EPA agreeing to fund the relocation of the residents of the trailer park. Nepera has distributed relocation settlements to the eligible residents.

IX. RECOMMENDATION

This decision document represents the selected removal action for the Pyridium Mercury Disposal Site No. 1 in the Village of Harriman, Orange County, New York, developed in accordance with CERCLA, as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site met the NCP Section 300.415(b)(2) criteria for the completed removal action. The total project ceiling cost for this removal action was $71,000, of which an estimated $51,000 came from the Regional removal allowance.

Please confirm the January 4, 1995 verbal authorization of funding for this Site, as per current Delegation of Authority, by signing below.

APPROVAL: _____ DATE: _____
Kathleen C. Callahan, Director
Emergency and Remedial Response Division

DISAPPROVAL: _____ DATE: _____
Kathleen C. Callahan, Director
Emergency and Remedial Response Division

cc: (after approval is obtained)

J. Fox, RA	R. Gherardi, OPM-FIN
R. Salkie, ERRD-ADREPP	S. Murphy, OPM-FAM
W. McCabe, ERRD-DDNYC/P	D. Dietrich, 5202G
G. Zachos, ERRD-RAB	T. Eby, 5202G
J. Rotola, ERRD-RAB	C. Moyik, ERRD-PS
M. Randol, EPD	M. O'Toole, NYSDEC
E. Schaaf, ORC-NYCSUP	T. Vickerson, NYSDEC
V. Capon, ORC-NYCSUP	C. Kelly, TATL

APPENDIX A

New York State Department of
50 Wolf Road, Albany, New York, 12[illegible]

Langdon Marsh
Commissioner

SEP 29 1994

Ms. Kathleen C. Callahan
Director
Emergency & Remedial Response Division
United States Environmental
Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

Dear Ms. Callahan:

Re: Pyridium Mercury Disposal Site
Harriman (V) Orange County, N.Y.

I have enclosed a copy of a letter from the New York State Department of Health, dated September 9, 1994, regarding confirmed mercury contamination in the soil beneath five trailer homes at the referenced location in the Village of Harriman, Orange County, New York.

The trailer park is located near Nepera, Inc., Harriman, which is listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York Sute as Site Code #3-36-006. We are presently trying to determine if the mercury contamination is related to the Nepera Site.

However, in the meantime, we hereby request that the USEPA conduct an Emergency Removal Assessment at the referenced location and initiate whatever response action is warranted by the findings of such an assessment and are authorized by CERCLA/SARA.

If you have any questions regarding this request, please contact Alan Rockmore, P.E., of my staff, at (518) 457-9180.

Sincerely,

Michael J. O'Toole, Jr.
Director
Div. of Hazardous Waste Remediation

Enclosure

cc: A. Carlson, NYSDOH
R. Salkie - USEPA, Edison, New Jersey
G. Zachos - USEPA, Edison, New Jersey
J. Witkowski - USEPA, Edison, New Jersey

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Center for Environmental Health 2 University Place Albany, New York 12203-3399

Mark R. Chassin M.D., M.P.P., M.P.H.
Commissioner
Paul Wilson
Executive Deputy Commissioner

Office of Public Health
Lloyd F. Novick, M.D., M.P.H.
Director
Diane Jones Ames
Executive Deputy Director
William N. Stasiuk, P.E., Ph.D.
Center Director

September 9, 1994

Mr. Michael J. O'Toole, P.E., Director
Division of Hazardous Waste Remediation
NYS Department of Environmental Conservation
50 Wolf Road, Room 212
Albany, New York 12233

SEP 12 '94

RE: Mitigating Potential Exposures
Pyridium Mercury Disposal Site
NYSDOH Site #336821N
(V) Harriman, Orange County

Dear Mr. O'Toole

As you know, both our agencies recently learned that five residential trailer homes sit over chemical wastes near the corner of Routes 17M and 71 in the Village of Harriman, Orange County. Within the five trailers live twelve residents including an expectant mother and her four year old son. The waste materials, suspected to be calcium sulfate and mercuric sulfide generated by the former Pyridium Corporation (presently Neuera, Inc.), were allegedly dumped during the late 1940's. Testing by the State has revealed significantly elevated levels of mercury in the surface soils and surface wastes ranging from 110 parts per million (ppm) to 658 ppm with an average mercury concentration of 286 ppm. Mercury is typically found in soils at levels less than 1 ppm. Residents have reportedly encountered the waste materials in recurring sinkholes/subsidences on the property, within soil excavations for fence posts and sewer lines, while gardening, and during wet conditions when their parking area turns milky-white. Allegedly children, new grown, had used the clay-like material as if it was "Playdoh."

Exposure to either inorganic or organic mercury can permanently damage the brain, kidneys, and developing fetus. The most sensitive target of low-level exposure to inorganic mercury appears to be the kidneys. Exposure to mercury in the soil can occur through a number of routes. There is the potential for direct oral exposure via ingestion of soil, dust, and garden produce grown in contaminated soil. Mercury can be absorbed into the body via dermal contact through activities associated with soil disturbances such as gardening, yard work, and play. There also exists the potential for inhalation of mercury particulates and mercury vapor.

The elevated levels of mercury in soil are a public health concern. To minimize potential human exposure to these accessible chemical wastes, residents have been advised to avoid physical contact with their yard soils which contain the easily distinguishable white waste material. Vegetable gardening is not recommended. These temporary advisories should be followed by a timely permanent solution. However, Extraction Procedure Toxicity testing by the New York State Department

of Environmental Conservation's contract laboratory did not confirm the presence of "hazardous waste" as legally defined by the State. Therefore, as I understand the process, State Superfund monies cannot be spent on any site-related activities that may be needed.

Consequently, the State should seek assistance from the United States Environmental Protection Agency (EPA) to expedite this matter for the long-term welfare of the concerned residents as well as for the protection of the environment. To that end, this Department is in the process of preparing a health consultation, which will be reviewed by the federal Agency for Toxic Substances and Disease Registry (ATSDR). We expect conditions at the site to meet the ATSDR's definition of a public health hazard. We will be forwarding a health consultation as soon as possible. In the meantime, the ATSDR and the EPA have been advised of the situation.

Should you wish to discuss this issue further, do not hesitate to contact me or Mr. Steven Bates at (518) 458-6310.

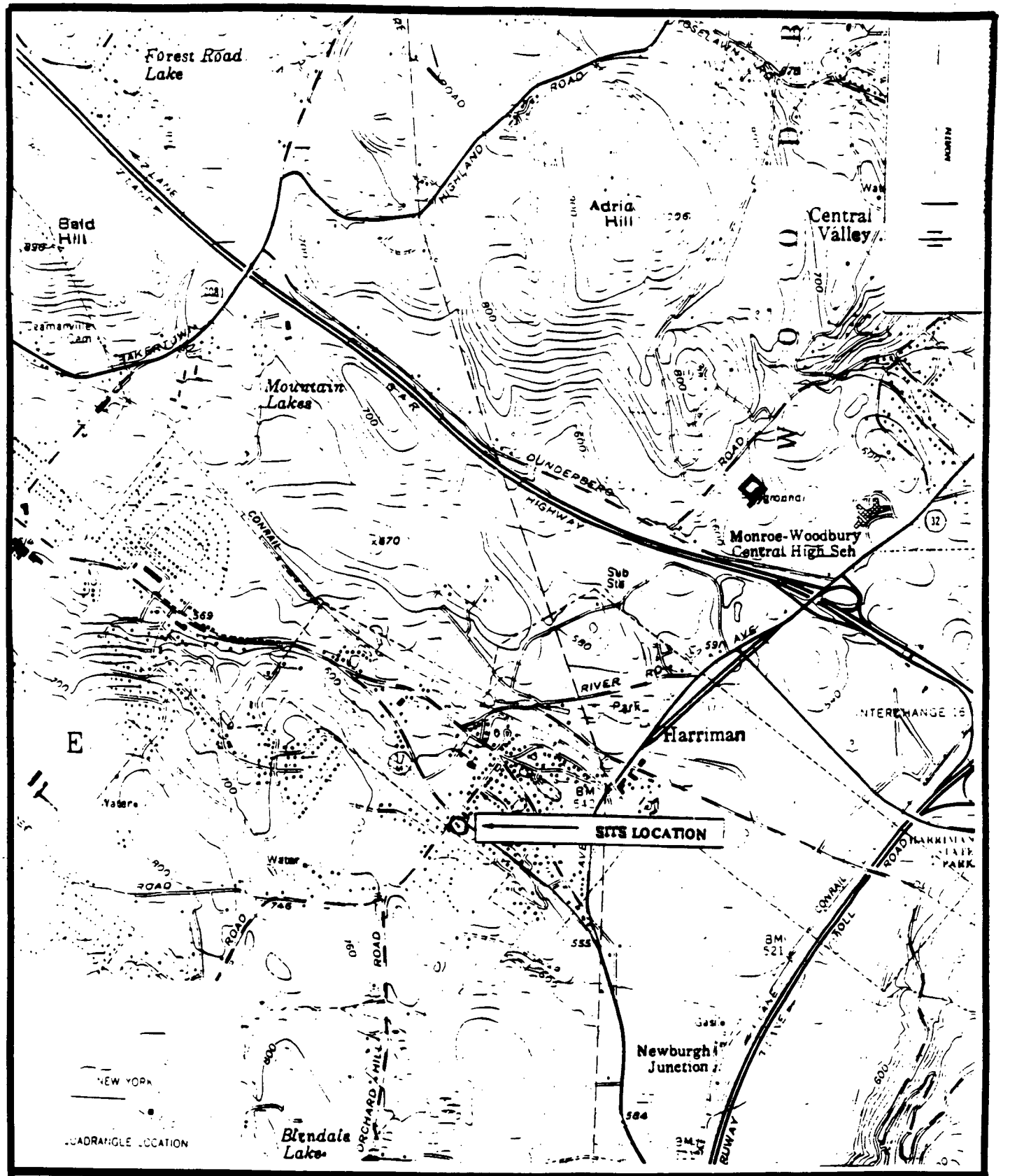
Sincerely,

G. Anders Carlson, Ph.D.
Director
Bureau of Environmental Exposure
Investigation

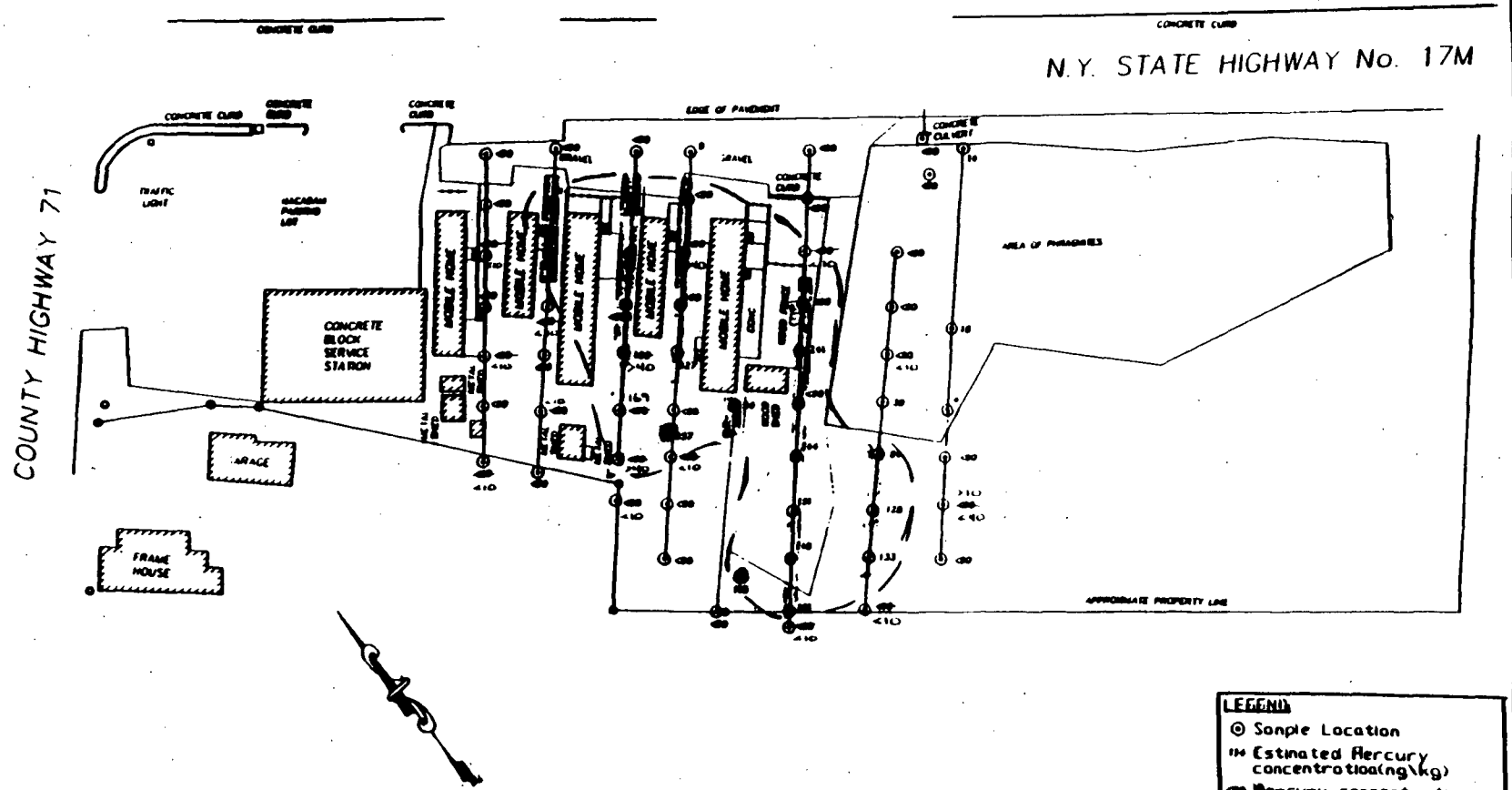
sg/94252PRO0019

cc: Dr. N. Kim
Mr. R. Tramontano/Mr. R. Svenson/Mr. F. Mrozek
Dr. E. Horn/Dr. D. Luttinger/Ms. P. Fritz
Ms. N. Knapp
Mr. S. Bates/Mr. M. VanValkenburg
Mr. M. Knudsen, MDO
Mr. M. Schleifer - OCHD
Mr. C. Goddard - DEC
Ms. S. McCormick/Mr. C. Magee DEC
Mr. D. Eaton - DEC
Mr. A. Klauss - DEC, Region 3
Mr. A. Block/Mr. S. Jones - ATSDR
Mr. W. McCabe - EPA, Region 2

APPENDIX B



WESTON Roy F. Weston, Inc. MAJOR PROGRAMS DIVISION	EPA PM D. HARKAY	FIGURE 1 SITE LOCATION MAP
M ASSOCIATION WITH FOSTER WHEELER CORP., C.C JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC. AND R.E. SARRIERA ASSOCIATES	TAT PM S. MAY	PYRIDIUM MERCURY DISPOSAL SITE NO. 1



Roy F. Weston, Inc. MAJOR PROGRAMS DIVISION	EPA PM D. HARKAY	FIGURE 2 SITE MAP
IN ASSOCIATION WITH FOSTER WHEELER CORP., C.C. JOHNSON & MALHOTRA P.C., RESOURCE APPLICATIONS, INC. AND R.E. SARRIERA ASSOCIATES	TAT PM S. MAY	PYRIDIUM MERCURY DISPOSAL SITE NO. 1

APPENDIX C

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 19
To Joe Rotola	From Joe Cruse
Co. EPA	Co. NYS DOH
Dept.	Phone # 457 6305
Fax # 908-321-4425	Fax #

DRAFT

HEALTH CONSULTATION

PYRIDIUM MERCURY DISPOSAL SITE #1
HARRIMAN, ORANGE COUNTY, NEW YORK
CERCLIS NO.

DECEMBER 1994

Prepared by:

New York State Department of Health
Under a Cooperative Agreement with the
Agency for Toxit Substances and Disease Registry

BACKGROUND AND STATEMENT OF ISSUES

The New York State Department of Health (NYS DOH) through a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) has reviewed information and analytical data from the Pyridium Mercury Disposal site to determine if there is a public health threat associated with exposure to mercury. The Pyridium Mercury Disposal site (Figure 1, Appendix A) is in the Village of Harriman, Town of Monroe, Orange County, near the corner of Routes 17M (Ramapo Avenue) and 71 (Harriman Heights Road). The area of concern (Figures 2A and 2B, Appendix A), which is about one acre in size, includes five single family trailer homes. The site, on record as the McGill Trailer Park, is under permit from the Orange County Health Department as a regulated mobile home park. The property is bounded to the northwest by an auto transmission shop, to the southwest by a residential lawn, to the southeast by wetlands, and to the northeast by Route 17M. The five trailers are occupied by sixteen residents including an expectant (12/94) mother and her four year old son. Three of those sixteen residents, a mother and her two teenage sons, moved in with a current resident well after the wastes had been identified and residents warned. Of the nine parents and seven children living on-site, the children's ages are 4, 14, 16, 17, 20, 28 and 31. Eleven Caucasians, three African Americans, and two Hispanics reside in the mobile home park. Young grandchildren are known to visit. According to an eyewitness, the waste materials, a mercuric or mercurous salt

generated during the production of niacinamide by the former Pyridium Corporation, were allegedly dumped during the late 1940's (1947-1948).

On August 8, 1994, the NYS DOH was notified of the potential health concern by the New York State Department of Environmental Conservation (NYS DEC). The NYS DEC forwarded recent correspondence from the property owner's attorney describing a white clay-like material (discovered behind the trailers) containing an elevated mercury level of 238 milligrams per kilogram (mg/kg). Mercury is typically found in soils at levels less than 1 mg/kg. In response, NYS DOH staff inspected the property on August 9, 1994. The suspected waste material was readily identified at the ground surface around trailers 3, 4 and 5. The easily distinguishable white waste material was observed in a sinkhole, between walkway steps, in a flower garden, beneath a trailer, in ant mounds, and underlying a few vegetable plants. Four surface (0-1 inch) soil/waste samples were collected and analyzed by the NYS DEC laboratory for total mercury. Mercury was detected at 110 mg/kg in a flower garden, 170 mg/kg in a sinkhole, 230 mg/kg behind a storage shed, and 320 mg/kg between sidewalk steps. At the request of the NYS DOH and the ATSDR, the US Environmental Protection Agency later contracted for further laboratory analysis (i.e., speciation) of the wastes. The material was identified as inorganic mercury: a mercuric or mercurous salt.

Some of the residents interviewed by NYS DOH staff during the August 9th visit reportedly had contact with the waste material when gardening and digging fence post holes. One parent, who has lived on-site for about twenty-five years said that while her children were growing up, they played with the clay-like waste as if it were modelling clay.

On August 11, 1994, NYS DEC staff collected additional environmental samples to determine if the waste materials could be classified as "hazardous waste" according to NYS DEC's legal definition. By NYS DEC's definition, a mercury waste sample would be regarded as a "hazardous waste" if the Extraction Procedure Toxicity (EPTox) analysis of the sample detected a concentration of the metal at or above 200 micrograms per liter (mcg/L). The EPTox test is used to determine the likelihood that mercury will leach from the waste and contaminate groundwater. The EPTox test alone does not determine if a chemical concentration in soil or waste is a public health concern. Six soil/waste samples and one surface water sample were taken. EPTox results for mercury in the six soil/waste samples ranged from 0.1 mcg/L to 20.0 mcg/L, well below the NYS DEC action level. Total mercury analyses were also performed. Concentrations detected near the trailers were: 196 mg/kg in a sinkhole at 18 inches below grade; 230 mg/kg in the same sinkhole at 6 inches below grade; 396 mg/kg beneath trailer #3; and 653 mg/kg immediately next to trailer #3 beneath (1-4 inches) a three plant vegetable garden. Mercury was detected in the

stone/soil driveway at 4.6 mg/kg and at 0.92 mg/kg in the bank of a stream running through the adjacent wetlands. Mercury was detected in a water sample from a culvert draining the wetlands at a level of 0.13 mcg/L.

On August 17 and 18, 1994, NYS DOH staff monitored indoor and outdoor air using a portable, instantaneous-reading mercury vapor analyzer (Jerome Model 411). Due to instrumentation problems, the data collected at that time are questionable and therefore, could not be used to adequately evaluate air quality.

Residents rely on the Village of Harriman municipal water supply for drinking water. These wells are not close to this site. The village water is regularly monitored to ensure that it meets State drinking water standards for public supplies. The service connections from the watermain to the trailers likely pass through buried waste materials. Entry of contaminants into the buried water pipes is unlikely. Should there be a crack, break, breach or compromise in the integrity of the waterline piping, positive pressure within the pipes would forte water out rather than allow contaminants to seep in. A major break in a waterline would be readily noticed by residents through a loss of water at the tap and by discolored (i.e., dirty) water.

DISCUSSION

Mercury is present at higher than normal levels in surface soil and surface waste at the Pyridium Mercury Disposal site. Exposure to mercury in surface soil and surface waste may occur by accidental eating of soil and dust, eating of garden fruits and vegetables grown in contaminated soils, skin contact or breathing of mercury contaminated dust or vapor. Children generally eat greater amounts of soil and dust than adults. This is especially true for preschoolers because they tend to put their hands or fingers in their mouths or for children with pica (an unreasonable craving), in this case, for soil. Those children who repeatedly handle the waste material would have a high likelihood of ingesting the mercury waste which could stick to their hands. Mercury contaminated soil can also be tracked into the home on shoes and left on floors and surfaces where people could come in contact with it. Indirect exposure for an infant can occur from eating contaminated breast milk if the mother were exposed to mercury.

Long-term exposure to mercury can damage the kidneys, nervous system and developing fetus (baby). The most sensitive target organ for low-level inorganic mercury exposure appears to be the kidneys.

Health risk comparison values are used to assess if further evaluation of the soil is needed. Several factors are considered in the evaluation including soil ingestion rate, the size and age of the exposed individual, length of exposure and the health

effects data. A health risk comparison value for mercury in soil is the mercury concentration in soil which would provide, by ingestion, a dose of mercury equal to the daily exposure below which adverse health effects are unlikely to occur. A contaminant at concentrations exceeding a health comparison value does not mean that either exposure to the concaminant or adverse health effects have occurred or will occur.

Health risk comparison values are developed assuming worst case exposure, i.e., the greatest likely exposure. Using soil ingestion rates for children with pica will overestimate soil ingestion rates for the general public.

Soil mercury concentrations identified at the site range from 110 to 653 ppm. Table 1 (Appendix B) contains soil health risk comparison values for inorganic mercury. The soil mercury concentrations at the site exceed some of the health comparison values. Therefore, the soil concentrations of mercury at the Pyridium Mercury waste disposal site warrant further characcerizaticn and evaluation of exposure pathways and the potential for adverse health effects in individuals who may have ceen exposed to the waste materials.

A child with pica has che highest exposure and, based on the highest soil mercury concentration (653 ppm), is at high risk of having adverse kidney effects. Children without pica and adults

are at minimal risk of having adverse kidney effects. Vegetables and fruit grown in contaminated soil are an additional source of exposure. Mercury levels are higher in plants grown in contaminated soil than in those grown in soil which is not contaminated. Eating such plants could contribute additional mercury to the diet.

On October 26, 1994, as recommended by the ATSDR's Health Activities Recommendation Panel, the NYS DOH conducted urine mercury screening of the residents living in the five mobile homes. A total of 14 individuals participated in the testing which involved the collection of first catch (first thing in the morning) urine samples. Analyses were performed by the NYS DOH Wadsworth Center for Laboratories and Research. All fourteen of these people had urine mercury levels within the normal range, below 20 micrograms per liter. Two residents were not included in the testing because they moved away on their own and could not be located.

The residents' urine mercury screening results indicate exposure has not caused an increase in mercury levels in the body to levels of concern for adverse health effects. The soil mercury concentrations at the site provide a source for exposure which could produce health effects in individuals whose activities lead to greater contact with the waste material.

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CONCLUSIONS

Based on the information raviewed, the NYS DOH in consultation with ATSDR concludes the following:

1. The Pyridium Mercury Disposal site is a public health hazard because inorganic mercury occurs in soil at concentrations which may cause health effects. Residents, particularly preschool children who may eat contaminated soil and residents eating plants grown in the contaminated soil, are at risk of kidney damage due to the mercury contamination at the Pyridium Mercury Disposal site.

2. Based on interviews with residents exposure to inorganic mercury has occurred by dermal contact.

3. The nature and extent of contamination at this site has not been completely characterized. Contamination other than inorganic mercury may be present within subsurface fill matarials. Sampling should extend outward and downward and includa groundwaeer.

4. Based on the results of the recent urine mercury screening, follow-up testing does not appear necessary at this time. The NYS DOH does not plan, at this time, to track previous site residents to conduct urine/mercury analysis since the

urine/mercury levels of the current site residents (those most likely at risk of exposure) were within the normal range. In addition, it is unlikely that mercury would be detected above the normal range in persons exposed several months before the urinary mercury testing because mercury leaves the body over time.

RECOMMENDATIONS

1. Measures should be taken to prevent exposures to yard soils which contain the mercury wastes. Dissociate (i.e., remove) all the residents, especially the expectant mother and her young child, from the wastes to prevent exposures that could damage their kidneys or neurological systems.

2. To evaluate exposure to mercury in the homes, air and dust samples should be collected within the trailers.

3. Completely characterize the nature and extent of contamination at the site. A comprehensive analysis of the wastes should be performed. Sampling of soils, wastes, and groundwater should extend outward and downward to determine areas requiring future remedial actions. Subsurface investigations might potentially identify other types of chemical wastes used as fill, or find buried drums, or detect groundwater contamination.

4. The company or agency that performs the additional environmental sampling should work with the NYS DOH so that sampling design and detection levels are appropriate to base further public health decisions upon.

5. Impose deed restrictions on the property in the absence of total waste removal.

HEALTH ACTIVITIES RECOMMENDATION PANEL RECOMMENDATIONS

The data and information developed in the Health Consultation for the Pyridium Mercury Disposal site, Harriman, New York, has been reviewed by ATSDR's Health Activities Recommendation Panel (HARP) to determine appropriate follow-up health actions. Because of past and current exposure to mercury-contaminated residential soils, the panel recommended this site for follow-up health activities. Specifically, those persons exposed should have urine samples collected and analyzed for the presence of mercury. In addition, the HARP also determined that community health and health professions education are indicated. The NYS DOH is currently conducting site-specific education activities at the site. Other health activities may be needed as more information about actual exposures and the nature of the waste materials are determined.

PUBLIC HEALTH ACTIONS

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Public Health Actions Taken

1. To provide information to the community about the site and to address health related concerns the NYS DOH has held two public meetings and a public availability session since August 1994.

2. The NYS DOH collected urine samples from the fourteen residents currently living on-site. The samples were analyzed for the presence of mercury by the NYS DOH Wadsworth Center for Laboratories and Research. All fourteen of these people had urine mercury levels within the normal range, below 20 micrograms per liter.

   All individuals and their physicians were provided with a copy of the urine sample results.

3. The site residents' physicians were provided with educational materials regarding the toxic effects associated with exposure to mercury.

4. NYS DOH physicians talked to several members of the community, on an individual basis, about health concerns related to the site.

Public Health Actions Planned

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1. It is planned that the residents will move off-site during January, 1988. Residents have been financially compensated by the Nepera Corporation who currently occupies the former Pyridium facility. The Nepera Corp. will arrange to have the residents moved from the site at no cost to the individual.

2. The NYS DOH will review all site-related investigation reports and health-related information and, if necessary, hold additional public meetings.

3. The NYS DOH will continue to investigate reports of the existence of other similar sites in the community.

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PREPARERS OF THE REPORT

Mark VanValkenburg
Environmental Health Specialist III
Bureau of Environmental Exposure Investigation
New York State Department of Health

and

Patricia Fritz
Assistant Research Scientist
Bureau of Toxic Substance Assessment
New York State Department of Health

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Table 1. SOIL COMPARISON VALUES FOR RESIDENTIAL EXPOSURE TO INORGANIC MERCURY

	COMPARISON VALUE				
	Ingestion of Soil			Soil and Homegrown Produce***	
Duration of Exposure:	Pica Child[1]	Child[2]	Adult[3]	Child[2]	Adult[3]
Short-term*	14 ppm	--	9800 ppm		
Long-term**	0.6 ppm	47 ppm	420 ppm	1.5 ppm	4.9 ppm

[1]Assumes child with pica weighs 10 kg and ingests 5000 milligrams (mg) of soil per day.

[2]Assumes a 13.2 kg child, and a time-weighted-average soil ingestion of 85.2 mg soil per day to account for weekly and seasonal variability when estimating chronic exposures.

[3]Assumes an adult weighs 70 kg and ingests 50 mg of soil per day.

*ATSDR has established short-term level for inorganic mercury of 0.007 milligram per kilogram per day (mg/kg/day). It is a level of short-term exposure to inorganic mercury below which adverse health effects are unlikely to occur.

**US EPA has established a long-term level for inorganic mercury of 0.0003 mg/kg/day. It is a level of long-term exposure to inorganic mercury below which adverse health effects are unlikely to occur.

***Assumes 40% consumption of homegrown fruits and vegetables.